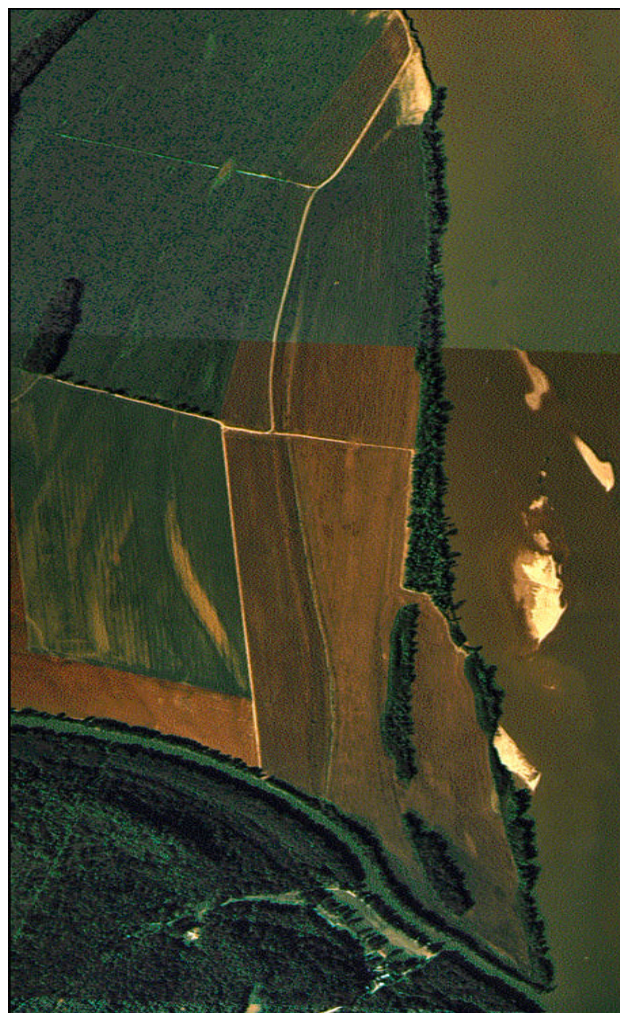
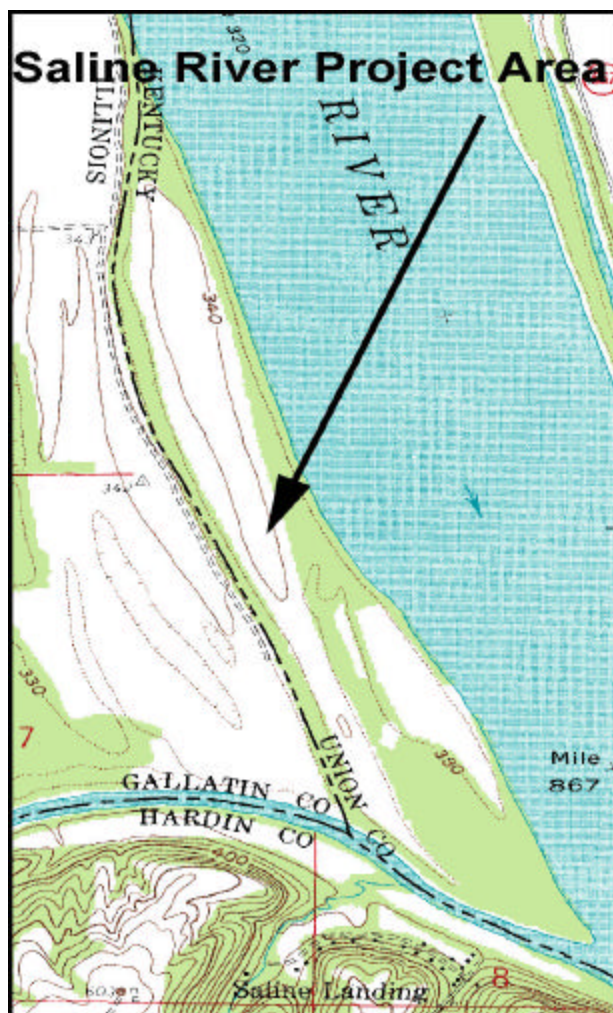


Saline River Habitat Restoration (KY-16)

1.0 Location

The proposed Saline River Habitat Restoration project area is located in Union County, Kentucky. The project area (approx. 240 acres) lies on the “Illinois side” of the Ohio River, but is actually located in Kentucky. The project area is located approximately 3 miles west of the town of Dekoven, Kentucky. The site is located between Ohio River miles (ORM) 866-877. The project site is within the Louisville District, U.S. Army Corps of Engineers (USACE).



2.0 Project Goal, Description, and Rationale

The primary goal of the Saline River Habitat Restoration project is to restore bottomland hardwood forests to the project area. Reforestation efforts would involve planting native mast producing bottomland hardwood trees, such as various oaks (*Quercus spp.*), while allowing natural recolonization of light mast producing trees such as cottonwood (*Populus deltoides*), silver maple (*Acer saccharinum*), and willows (*Salix spp.*). The restored bottomland hardwood forest would provide seasonal or year-round habitat for a variety of species, promote clean water, reduce soil erosion and stream sedimentation, and provide increased recreational opportunities.

3.0 Existing Conditions

Terrestrial/Riparian

Habitat: Most of the land within the proposed project area is currently predominated by actively farmed cropland. A narrow band of remnant riparian forest dominated by silver maple separates the extensive croplands from the Ohio and Saline Rivers.



Aquatic Habitats: Aquatic habitats consist of low flow (slackwater) habitat in the Saline River to the south of the project area and moderate flowing water in the Ohio River on the eastern edge of the area. The narrow band of vegetation that currently separates the rivers from the extensive croplands provides little protection for aquatic habitats adjacent to the project area.



Wetlands: Because most of the land within the project area has been converted to cropland, there are no remaining wetland habitats.

Federally-Listed Threatened and Endangered Species: According to the U.S. Fish and Wildlife Service (USFWS), there are 3 federally-listed endangered species and 2 federally-listed threatened species known to occur in Union County, Kentucky. These species are listed on Table 1.

The riparian corridor adjacent to the Ohio River may provide summer roost habitat for the Indiana bat. Preferred tree species would include a mixture of oaks, silver maple, cottonwood, and shagbark hickory (*Carya ovata*) (INHS, 1996). The riparian corridor would also provide feeding/foraging habitat for the Indiana bat.

Bald eagles may utilize forested areas for roosting/perching habitat and feed in the open water areas. There are no known eagle nests within the project area.

The interior least tern and the piping plover are typically associated with sandbar habitats in large river systems. Open sandbar habitats are used as nesting/brood rearing habitat and shallow water areas are used for feeding. There is no suitable least tern or piping plover habitat within the boundaries of the project area, however suitable habitat does exist in the Ohio River near the project area.

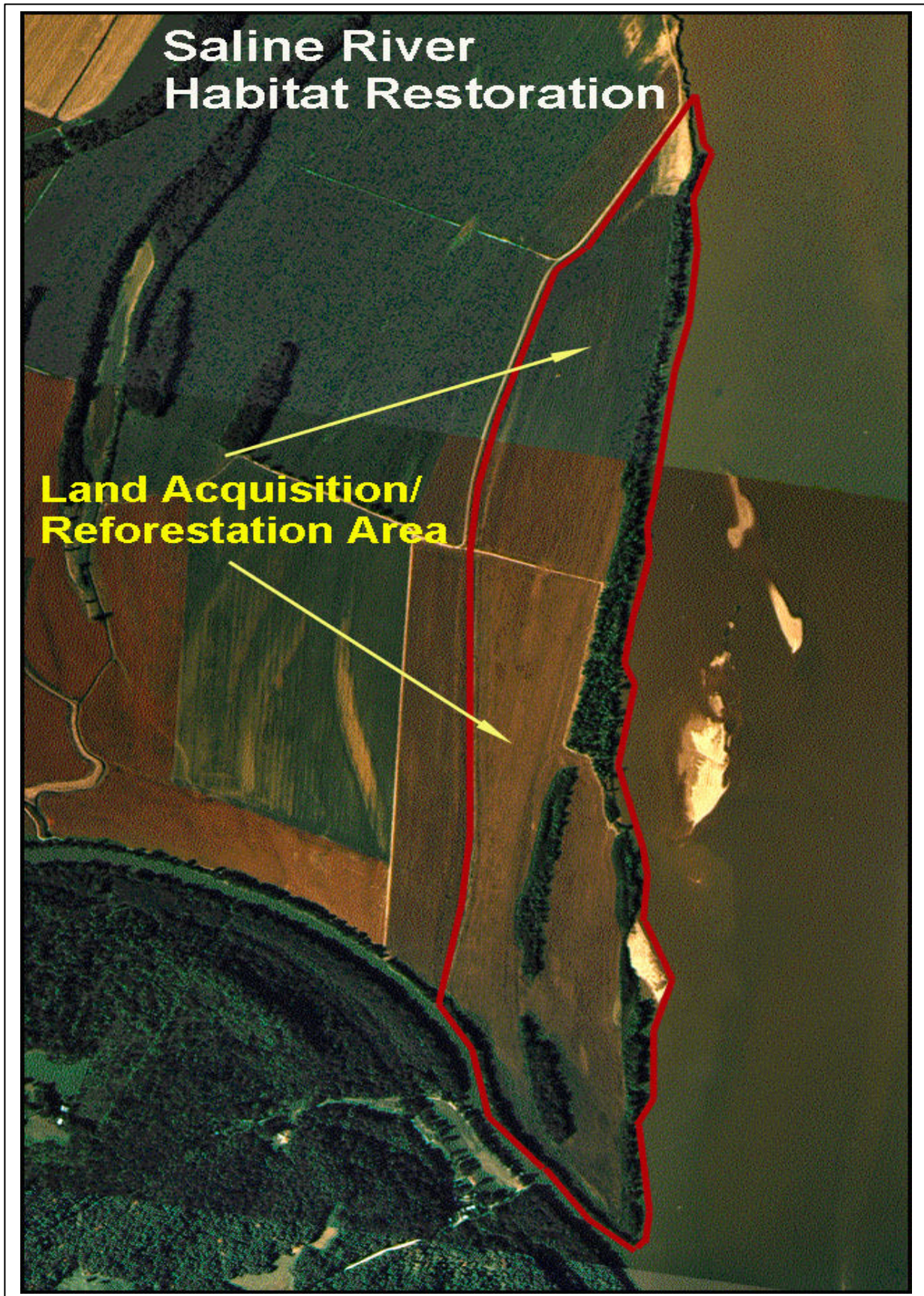
The fat pocketbook mussel is a freshwater species that typically inhabits large river systems. This mussel is typically found in habitats with muddy or sandy substrates and slow flowing water.

Table 1. Federally-listed species known to occur in Union County, Kentucky.

Common Name	Scientific Name	Federal Status	Potential Habitat Present
Indiana bat	<i>Myotis sodalis</i>	Endangered	Yes
bald eagle	<i>Haliaeetus leucocephalus</i>	Threatened	Yes
interior least tern	<i>Sterna antillarum</i>	Endangered	No
piping plover	<i>Charadrius melodus</i>	Threatened	No
fat pocketbook mussel	<i>Potamilus capax</i>	Endangered	No

Source: U.S. Fish and Wildlife Service, 1999

4.0 Project Diagram



5.0 Habitat Restoration Design

5.1 Existing Ecological/Engineering Concern

Most of the land within the proposed Saline River Habitat Restoration area has been converted to cropland. Because the project area lies adjacent to both the Ohio and Saline Rivers, there are concerns that sediments and pollutants from these croplands could potentially decrease water quality in the rivers via stormwater runoff. Reforestation of the project area would provide important habitat for a variety of species, protect water quality, and potentially reduce soil erosion.

5.2 Bottomland Hardwood Reforestation

Over 90% of the 240-acre proposed project area is currently non-forested land consisting mostly of cropfields. The existing forest occurs in narrow bands along the Ohio and Saline Rivers. These narrow bands of forests provide few benefits for wildlife, water quality, or recreational opportunities. All of the open land on the 240-acre area would be reforested by planting native mast producing bottomland hardwood trees and allowing natural regeneration of other bottomland trees. This reforested area would provide important habitat, protect water quality, and provide increased recreational opportunity.

Based on suggestions provided by the Kentucky Division of Forestry, the preferred tree species to plant in the area would include swamp chestnut oak (*Quercus michauxii*), swamp white oak (*Quercus bicolor*), overcup oak (*Quercus lyrata*), pin oak (*Quercus palustris*), cherrybark oak (*Quercus pagodaefolia*), Nuttall oak (*Quercus nuttallii*), willow oak (*Quercus phellos*), bur oak (*Quercus macrocarpa*), and bald cypress (*Taxodium distichum*). Aggressive light mast producing species, such as silver maple, green ash (*Fraxinus pennsylvanica*), sycamore (*Platanus occidentalis*), eastern cottonwood, and willows, would be allowed to reestablish themselves through natural seed dispersal.

Soil types, hydrology, and terrain position will be the primary factors considered when selecting the tree species to be planted in the area. A detailed planting design, which would be part of the overall project management/master plan, should be developed in order to insure that the planting effort is successful. Costs for reforestation are shown on Table 2.

Open areas that can not be reforested will be maintained in order to provide habitat diversity. Mowing, burning, and/or tilling may be used to maintain these open areas. Depending upon the type of wildlife management prescribed in the project management plan, other openings such as foodplots or agricultural outleashes may be desirable to provide increased foraging opportunities for a variety of species.

6.0 Cost Estimate (Reforestation)

Reforestation cost estimates are summarized on Table 2. A detailed MCACES cost estimate for the proposed project is included in Appendix C.

Table 2. Project Costs.	
Item	Costs
Prepare Project Management/Master Plan	\$5,000
Land Acquisition (240 acres)	\$240,000
Reforestation (220 acres @ \$219.30/acre)	\$48,200
TOTAL	\$293,200

7.0 Schedule

Estimated plan development and reforestation times are shown on Table 3.

Table 3. Construction Schedule.	
Item	Time
Preparation of Management/Master Plan	6 months
Land Acquisition	1 year
Bottomland Hardwood Reforestation	1-2 years

8.0 Expected Ecological Benefits

Terrestrial/Riparian Habitats: Implementation of the proposed project would provide beneficial impacts to terrestrial and riparian resources in the project area. Reforestation would decrease the amount of forest fragmentation in the area and provide habitat for a number of neotropical migrant birds, bald eagles, Indiana bats, deer, furbearers, and several other organisms.

Aquatic Habitats: Implementation of the proposed project could benefit aquatic resources in the project area. The conversion of agricultural land to bottomland hardwood forest would indirectly improve water quality by reducing the amount of silt and contaminants from entering the Ohio and Saline Rivers via stormwater runoff.

Wetlands: Restoration of bottomland hardwood forests and potentially associated wetlands, would add to the amount of jurisdictional wetlands in the area. Bottomland forest wetlands provide habitat for numerous species of wildlife including waterfowl, deer, wild turkey, and the copperbelly watersnake, which is a species of special concern in the area.

Federally-Listed Threatened and Endangered Species: Restoration of the bottomland hardwood wetlands will provide summer roosting habitat and foraging habitat for the endangered Indiana bat. Winter habitat for the bald eagle would also be provided as a result of implementing the proposed project.

Socioeconomic Resources: There would be potential long-term beneficial impacts to socioeconomic resources as a result of implementing the proposed project. Long-term benefits would be realized through improved recreational opportunities for hunting, fishing, wildlife observation, and other non-consumptive uses.

9.0 Potential Adverse Environmental Impacts

Terrestrial/Riparian Habitats: There would be no foreseeable adverse impacts to terrestrial or riparian resources as a result of implementing the proposed project.

Aquatic Habitats: There would be no foreseeable adverse impacts to terrestrial or riparian resources as a result of implementing the proposed project.

Wetlands: There would be no foreseeable adverse impacts to jurisdictional wetlands as a result of implementing the proposed project.

Federally-Listed Threatened and Endangered Species: There would be no foreseeable adverse impacts to federally-listed threatened or endangered species as a result of implementing the proposed project.

Socioeconomic Resources: There would be potential long-term adverse impacts to local farmers currently farming land in the proposed project area due to conversion of productive cropland to bottomland hardwood forest.

10.0 Mitigation

No mitigation would be required for implementation of the proposed project.

11.0 Preliminary Operation and Maintenance Costs:

Operation and maintenance costs would be expected to be minimal if the initial reforestation efforts were successful. Some additional costs may be required if the land is actively managed in the future to provide increased diversity for wildlife and/or recreational opportunities.

12.0 Potential Cost Share Sponsor(s)

- ◆ Kentucky Department of Fish and Wildlife Resources
- ◆ Illinois Department of Natural Resources
- ◆ Natural Resources Conservation Service
- ◆ Kentucky Land Heritage Trust
- ◆ The Nature Conservancy
- ◆ Ducks Unlimited
- ◆ Partners In Flight

13.0 Expected Life of the Project

As presently envisioned, the Saline River Habitat Restoration project area would be managed in perpetuity for the benefit of natural resources by the Kentucky Department of Fish and Wildlife Resources or another state agency.

14.0 Hazardous, Toxic, and Radiological Waste Considerations

Potential impacts of hazardous, toxic, and radiological waste (HTRW) at the site were visually assessed during a site visit.

Site Inspection Findings.

The Ohio River flows from north to south past the project area, which consist of the mouth of Saline River at ORM 866 and a peninsular landmass protruding from the north into the mouth of the Saline River. The Saline River originates in Illinois and flows from west to east to the Ohio River at Gallatin County, Illinois. The Kentucky state line runs along the west side of the peninsula and this land mass, although located on the on the Illinois side of the Ohio River is actually part of Union County, Kentucky.

The following environmental conditions were considered when conducting the July 15, 1999 project area inspection:

- | | |
|-----------------------------|--------------------------------------|
| ◆ Suspicious/Unusual Odors; | ◆ Above Ground Storage Tanks (ASTs); |
| ◆ Discolored Soil; | ◆ Underground Storage Tanks (USTs); |
| ◆ Distressed Vegetation; | ◆ Landfills/Wastepiles; |
| ◆ Dirt/Debris Mounds; | ◆ Impoundments/Lagoons; |
| ◆ Ground Depressions; | ◆ Drum/Container Storage; |
| ◆ Oil Staining; | ◆ Electrical Transformers; |

- ◆ Standpipes/Vent pipes;
- ◆ Surface Water Discharges;
- ◆ Power or Pipelines;
- ◆ Mining/Logging; and
- ◆ Other.

Corn fields predominate the project area, which has a thin riparian zone running along its boundary.

HTRW Findings and Conclusions

None of the environmental conditions listed above were observed in the project area.

15.0 Property Ownership

Table 5. Property Characteristics				
Site Name: Saline River Habitat (Johnson Island)				
Location: Union County, Kentucky				
Map/Parcel Number	Owner	Mailing Address	Market Value	Acreage
5/1	Paul Henshaw, EST	C/o Joyce Henshaw 2398 SR 2834 Sturgis, KY 42459	\$100,000	200.00
5/4	Robert Karr	2109 Main Street Carrsville, KY 42081	\$2,500	41.00
* Denotes improvements on property.				

16.0 References

References:	
INHS, 1996	Illinois Natural History Survey Reports, March-April 1996. Survey Document #2152. Center for Biodiversity (J. Hofmann).
USFWS, 1983	U.S. Fish and Wildlife Service, 1983. Northern States Bald Eagle Recovery Plan. USFWS Denver, Colorado
USFWS, 1983	U.S. Fish and Wildlife Service, 1983. Recovery Plan for the Indiana Bat (<i>Myotis sodalis</i>).
USFWS, 1999	U.S. Fish and Wildlife Service, August 6, 1999. Federally Listed Endangered and Threatened Species in Kentucky.

APPENDIX A Threatened & Endangered Species

APPENDIX B Plan Formulation and Incremental Analysis Checklist

Project Site Location: The proposed Saline River Habitat Restoration project area is located in Union County, Kentucky. The project area (approx. 240 acres) lies on the Illinois side of the Ohio River, but is actually located in Kentucky. The project area is located approximately 3 miles west of the town of Dekoven, Kentucky. The site is located between Ohio River miles (ORM) 866-877. The project site is within the Louisville District, U.S. Army Corps of Engineers (USACE).

Description of Plan selected: The main goal of the proposed plan is to restore bottomland hardwood forest on the entire project area. Native mast producing bottomland hardwood trees would be planted while other bottomland hardwood trees would be allowed to naturally recolonize the area.

Alternatives of the Selected Plan:

Smaller Size Plans Possible? Yes. Limit the area to be reforested to a 300-foot wide riparian buffer along the Ohio and Saline Rivers.

Larger Size Plan Possible? No

Other alternatives? No

Restore/Enhance/Protect Terrestrial Habitats? ☐ Yes **Objective numbers met** ☐ T1, T3

Restore, Enhance, & Protect Wetlands? ☐ Yes **Objective numbers met** ☐ W1

Restore/Enhance/Protect Aquatic Habitats? ☐ Yes **Objective numbers met** ☐ A8

Type species benefited: Neotropical migrant birds, Indiana bats, bald eagles, furbearers, and numerous other bottomland hardwood forest dependant species.

Endangered species benefited: Indiana bats

Can estimated amount of habitat units be determined: Approximately 200 acres of bottomland forest would be restored/created.

Plan acceptable to Resources Agencies?

U.S. Fish & Wildlife Service?

State Department of Natural Resources?

Plan considered complete?

Connected to other plans for restoration?

Real Estate owned by State Agency? No

Federal Agency? No

Real Estate privately owned? Yes

If privately owned, what is status of future acquisition? Acquisition or agreements would be required.

Does this plan contribute significantly to the ecosystem structure or function requiring restoration? What goal or values does it meet in the Ecosystem Restoration Plan?

The restored bottomland hardwood forest would provide seasonal or year-round habitat for a variety of species, promote clean water, and reduce soil erosion and stream sedimentation.

Is this restoration plan a part of restoration projects planned by other agencies? (i.e. North American Waterfowl Management Plan, etc.)

Unknown.

In agencies opinion is the plan the most cost effective plan that can be implemented at this location?

Can this plan be implemented more cost effectively by another agency or institution?

Yes / No

Who:

From an incremental cost basis are there any features in this plan that would make the project more expensive than a typical project of the same nature? For embayment type plans is there excessive haul distance to disposal site? More expensive type disposal? Spoil that requires special handling/disposal?

Potential Project Sponsor:

Government Entity: _____

Non-government Entity _____

Corps Contractor _____ Date _____

U.S. Fish & Wildlife Representative _____ Date _____

State Agency Representative _____ Date _____

U.S. Army Corps of Engineers Representative _____ Date _____

Terrestrial Habitat Objectives

- T1 Riparian Corridors
- T2 Islands
- T3 Floodplains
- T4 Other unique habitats (canebrakes, river bluffs, etc.)

Wetland Habitat Objectives

- W1 Forested Wetlands: Bottomland Hardwoods
- W2 Forested Wetlands: Cypress/Tupelo Swamps and other unique forested wetlands
- W3 Scrub/Shrub Emergent Wetlands: isolated from the river except during high water and contiguous (includes scrub/shrub wetlands in embayments and island sloughs)

Aquatic Habitat Objectives

- A1 Backwaters (sloughs, embayments, oxbows, bayous, etc.)
- A2 Riverine submerged and aquatic vegetation
- A3 Sand and gravel bars
- A4 Riffles/Runs (tailwaters)
- A5 Pools (deep water, slow velocity, soft substrate)
- A6 Side Channel/Back Channel Habitat
- A7 Fish Passage
- A8 Riparian Enhancement/Protection

APPENDIX C Micro Computer-Aided Cost Engineering System (MCACES)